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# THE COSTS AND BENEFITS OF OIL IMPORT FEES: A CRITIQUE AND REVISION OF THE ANALYSIS IN THE DOE *ENERGY SECURITY* REPORT

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## MEMORANDUM OF THE CHAIRMAN

*To Members of the Senate Committee on Energy and Natural Resources:*

In March of 1987, the Department of Energy (DOE) released a report entitled "Energy Security: A Report to the President of the United States." The report was in response to the President's request that the Department review the nature and scope of the Nation's energy security concerns and evaluate policies that might meet national objectives in this area. The report examined the adequacy and security of all of our energy supplies, giving particular attention to oil.

One key element of the Department's report was an evaluation of the use of an oil import fee to reduce dependence on foreign supplies and encourage domestic production. DOE performed an economic analysis that attempted to quantify the costs and benefits of import fees. This cost-benefit analysis concluded that the costs of import fees far exceed the benefits. The methodology and conclusion of this part of the report were controversial from the start and were criticized by analysts in both the oil industry and academia.

Given this controversy, and my own doubts as to the objectivity of the DOE analysis, I asked Karl Hausker, the Committee Staff Economist, to (1) review the cost-benefit analysis of oil import fees presented in "Energy Security," and assess whether it was done in an objective and unbiased manner; (2) make any changes in methodology or assumptions that would lead to a more objective appraisal of costs and benefits; and (3) report any changes in the analysis or conclusions.

The result is before you. Dr. Hausker's report describes a number of flawed assumptions made by DOE that biases the analysis toward the conclusion that oil import fees carry far more costs than benefits. Using more defensible assumptions, the report estimates that import fees would provide positive net benefits to the Nation's economy.

I recommend you read this report. It corrects a major misperception in DOE's original study. Remember also that cost-benefit analysis is one important tool in evaluating public policies, but it should not be the sole criterion. Nonquantifiable costs and benefits must be examined as well. The energy security problem is one of the most difficult, tangled problems we face. This report is one step toward untangling it.

J. BENNETT JOHNSTON, *Chairman.*

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# THE COSTS AND BENEFITS OF OIL IMPORT FEES: A CRITIQUE AND REVISION OF THE ANALYSIS IN THE DOE ENERGY SECURITY REPORT

by

Karl Hausker

Staff Economist

Senate Energy and Natural Resources Committee

## OVERVIEW

In March 1987, the Department of Energy (DOE) released its Energy Security report to the President. One section of that report presents a cost-benefit analysis of three different oil import fees. In each case, the analysis concludes that the cost of the import fee would exceed the benefit. Some of the assumptions underlying DOE's analysis create a bias against oil import fees. This paper demonstrates that if one used more objective assumptions, the DOE analysis would conclude that the oil import fees would provide net economic benefits to the nation.

Any cost-benefit analysis is useful only to the extent its assumptions are realistic and defensible. In the case of the Energy Security report, the conclusion of the analysis rests largely on one very questionable assumption: the treatment of the macroeconomic "adjustment losses" associated with oil import fees. DOE assumes that there would be large, unending macro adjustment losses. This paper critiques this assumption and presents an alternative, namely, that the adjustment loss will be significant but will last only one year.

A second somewhat questionable assumption in the DOE study involves the discount rate. DOE uses a relatively high discount rate (10 percent real). The analysis presented here uses a 5 percent discount rate, a rate more in the middle of the range of rates suggested by economists.

Lastly, the DOE study performs some sensitivity analysis on the year a supply disruption occurs. The base case value is 1995; the Department also examines disruptions in 1990 for a $10 per barrel fee. This paper gives a more comprehensive analysis by examining three disruption scenarios (1988, 1991, and 1995) for three types of import fees.

This paper evaluates the costs and benefits of oil import fees using the assumption changes summarized above. The analysis is based on the same DOE computer models used in the Energy Security report. However, the Department in no way endorses the changes in assumptions or conclusions discussed in this paper.

In the section below, the DOE analysis is summarized and the importance of the treatment of macroeconomic losses is highlighted. The next section critiques the DOE methodology for estimating macroeconomic losses and presents an alternative. We then turn to a discussion of discount rates and the timing of an oil supply disruption. The final section presents the results of the cost-benefit analysis using the specified changes in assumptions. The results are summarized in the table below. For all three fees analyzed ($5/bbl, $10/bbl, and $24/bbl variable), and for each of the three disruption years, the net benefits of a fee are positive. (The floor of the variable import fee was

raised from $22 per barrel in the DOE analysis to $24 per barrel to make it consistent with Senate Bill 971.)

NET BENEFITS OF AN OIL IMPORT FEE (BILLIONS OF 1985 DOLLARS)

| Type of Fee | Year of Disruption | | |
|---|---|---|---|
| | 1988 | 1991 | 1995 |
| $5/bbl | 11.9 | 31.0 | 22.3 |
| $10/bbl | 10.3 | 41.6 | 23.8 |
| $24/bbl (variable) | 13.1 | 31.8 | 5.2 |

Computer print-outs of the DOE model (as modified by the Committee staff) appear in the Appendix to this paper. One final caveat: cost-benefit analysis should never be the sole determinant of a policy decision. Non-quantifiable benefits and costs can be equally important in shaping policy.

SUMMARY OF OIL IMPORT FEE ANALYSIS IN DOE STUDY

The DOE report Energy Security presents a cost-benefit analysis of three different oil import fees: $5 and $10 per barrel fees, and a variable fee that would create a $22 per barrel floor price. The time period of the analysis is 1988-1995. The models assumed a significant supply disruption would occur in 1995.

The two benefits of import fees estimated by the model are a reduction in the nation's payments for oil imports, and a security benefit gained from lower price and lower imports in the event of a disruption. The import fee would raise the domestic price of oil, thus lowering U.S. demand. Lowered U.S. demand would tend to lower the world price of oil because U.S. demand is such a large part of world demand. Therefore, the U.S. will pay a lower world price (plus the import fee) for its imported oil. The import fee, of course, is not a cost to the nation; it is simply a transfer from consumers to government.

The security benefits are summarized well in Energy Security (DOE, 1987, p. D-17):

> 1. An import fee will cause the United States to enter an oil supply disruption with a lower level of imports, and consequently lower payments for imported oil during a disruption due to this lower import level.

2. If an import fee actually exerts an effect on the disrupted oil price, it would imply a lower disrupted world oil price with a fee than without a fee. If this situation occurs, an additional benefit will accrue due to this difference in disrupted price.

3. The impact of a supply disruption on the economy will be smaller because the oil import level before a supply disruption is smaller. In addition, if the import fee is waived during a supply disruption, the impact of disrupted price on GNP will be smaller.

The two costs of import fees estimated by the model are a permanent welfare loss to the economy resulting from higher domestic oil prices, and a macroeconomic adjustment loss that would result from the transition from lower to higher oil prices. The welfare loss stems from the drop in demand from higher prices: those consumers who reduce oil consumption permanently either switch to a higher-cost substitute or go without. In either case, the benefits of the lower-cost oil are lost. In contrast, those consumers who maintain their oil consumption are still getting some benefit while paying a fee to the government. Once again, these fees are not costs to the economy but simply transfers from consumers to government.

The macroeconomic adjustment loss is a transitional phenomenon: the increase in oil prices temporarily decreases aggregate spending and causes a reallocation of resources within the economy. This reallocation causes some temporary idling of capital and labor, hence the economy produces below its potential. The next section will examine macro losses in detail.

It is essential to understand the pivotal role the macro loss plays in the DOE analysis. The size of the macro loss dwarfs that of the other three components of the analysis. Its large size effectively ensures that any small variation in the estimates of the other components will not change the conclusion that import fees would be costly to the nation. The table below reveals the relative size of the macro loss and its effect on the net benefit calculation. For each of the three fees, the net benefits would be positive if not for the macro loss which swings the net benefit calculation sharply negative.

COST AND BENEFITS OF AN OIL IMPORT FEE (BILLIONS OF 1985 DOLLARS)

| | $5/bbl | $10/bbl | $22/bbl (var.) |
|---|---|---|---|
| Reduction in Oil Imports | 22.5 | 36.9 | 27.6 |
| Security Benefits | 6.5 | 9.3 | 2.4 |
| Welfare Loss | -2.9 | -11.3 | -6.6 |
| Net Benefits W/out Macro Loss | 26.1 | 34.9 | 23.4 |
| Macro Loss | -99.3 | -188.8 | -134.8 |
| Net Benefits With Macro Loss | -73.2 | -153.9 | -111.4 |

CRITIQUE OF DOE METHODOLOGY FOR ESTIMATING MACROECONOMIC LOSSES

DOE's calculation of the two components of benefits and of one of the two components of cost (welfare loss) is done in a straightforward and defensible manner. However, the methodology underlying the estimation of the macroeconomic adjustment loss is controversial. This is a complex issue that requires some background.

Any sudden, substantial price change can cause a macroeconomic adjustment loss. A price shock can change the distribution of income among consumers and producers and lead to a temporary reduction in aggregate spending. This can depress the overall level of economic activity.

A price change can also mean that resources must be reallocated within the economy. If oil prices go up, the price of goods ranging from gasoline to plastic wrap goes up, and the demand for these products goes down. The demand for goods such as insulation and fuel-efficient cars goes up. The output of some firms goes up, while that of other firms goes down. Capital and labor must be reallocated to bring about these changes. This reallocation cannot take place quickly or painlessly. Machines may lay unused for some time. Workers may have to move or retrain for other jobs. Decreased aggregate spending and idle economic resources mean the economy is producing below its potential, producing fewer goods and services, thus incurring a macroeconomic adjustment losses.

The DOE methodology for estimating the macro loss caused by an import fee is easy to describe. A percentage change in oil price is translated to a percentage change in gross national product by a GNP elasticity multiplier. DOE uses a multiplier of -0.021. This implies, for example, that a doubling of oil prices would lead to a 1.4% decline in GNP.

DOE draws its GNP elasticity multiplier from empirical work by Darby (1982). The Department uses Darby's estimate of a long-run (permanent) GNP elasticity multiplier despite DOE's own

acknowlegement that the estimate is not statistically significant (a point we will return to later). The result of using Darby's estimate is that DOE predicts macro losses of tens of billions of dollars each year.

DOE buttresses these numbers by citing the estimates of macro losses from two elaborate computer models (the DRI Annual Model and EIA's MINMAC model). These models produce macro loss estimates of similar magnitude. DOE also cites a recent survey of macroeconomic models conducted by the Stanford University Energy Modeling Forum (EMF) as providing additional support for its use of a GNP elasticity multiplier of -0.021.

The Department's approach in estimating macro losses requires one to assume that the economy never adjusts to higher oil prices. Furthermore, DOE assumes that the import fee revenues are used to reduce the federal deficit, and that there is no fiscal or monetary policy instituted to cushion the effect of the import fee.

The Department's methodology in estimating macro losses is questionable on a number of grounds. First of all, DOE's reliance on Darby's work is puzzling, given its inconclusive nature. Darby's estimate of the long-run GNP elasticity multiplier is statistically insignificant. In other words, using conventional standards, Darby could not be confident that oil price changes had any long-run effect on GNP. In contrast, Darby's one-year, short-run estimates were significant, lending credit to the notion of a short-run macro loss. Note also that Darby examined the effect of external oil price shocks in which revenues flowed out of the consuming country. Common sense argues that import fees would have less of an impact by keeping more revenue inside the consuming country.

Another consideration is that import fees of the size contemplated in Energy Security would lead to oil prices equal to or below those levels experienced in the past. Darby's research covered the oil price shocks of the 1970s when prices climbed to unprecedented heights. However, in 1980-1981, the world oil price was above $40/bbl. In 1985, it had dropped to $27/bbl -- still relatively high by today's standards. Expectations in the early 80's were that oil prices would remain in the $30/bbl range for some time and then continue escalating in the 1990's (e.g., DOE's Energy Projections to the Year 2010, 1983, p. 4-4). Five or ten dollar import fees would cause oil prices to rise to levels at or below those experienced in the first five years of this decade. Therefore, some of the economic adjustments one would otherwise expect from a oil price increase have already been made, and Darby's estimates of the impact of higher oil prices are overstated. For instance, homeowners did not remove insulation from their attics when oil prices dropped in 1986, nor did businesses mothball energy-efficient equipment purchased prior to the price collapse.

To support its position, the Department also points to the more elaborate DRI and EIA models that forecast large and long-lasting macro losses. However, the Congressional Budget Office has examined these models and reaches a very different conclusion: GNP probably would decline in the short run due to an import fee, but could be somewhat higher or lower in the long run. The CBO study concludes (1986, p.3):

> [U]nder a broad range of assumptions, the various forces tend to offset each other and it is difficult to imagine real GNP undergoing large deviations from its baseline path in the long term.

CBO questions two major assumptions in the models: first, that an oil import fee would not affect world oil prices. (This assumption was maintained in the DRI study cited in Energy Security, but not in the report itself.) Second, the models assume that the increased income of oil producers does not significantly offset the decreased income of oil consumers, hence the decrease in aggregate spending is quite large.

The third source of support for the DOE position cited in Energy Security is the Energy Modeling Forum (EMF) survey. The survey did indeed conclude that macro losses similar to those calculated by DOE could occur if there were no fiscal or monetary policies to cushion the impact. However, the study goes on to argue that if such policies were in place the macro loss could be a small fraction of what it would otherwise be, or might be avoided altogether. Thus the bottom line of the EMF survey is that large macro losses are not an inevitable consequence of oil price rises.

EMF examined several policies that could cushion the impact of higher oil prices. In the area of monetary policy, government could allow faster growth of the money supply. In the area of fiscal policy, income taxes or payroll taxes could be cut, or an investment tax credit could be increased. These policies tend to increase aggregate consumption, investment, and/or employment. Recent actions by the Federal Reserve Board in coping with the October 1987 stock market crash illustrate the ability of monetary policy to ease the effect of an economic shock. The collapse of stock prices created a sudden surge in the demand for money to handle the huge volume of stock transactions. The Fed is widely credited with easing the money supply at the time of the crisis, and thus averting potentially larger damage to the economy (Wall Street Journal, 1987).

While the arguments above do not provide certain proof that the DOE methodology is wrong, they do establish that there is little empirical or intuitive support for the use of Darby's long-run GNP elasticity multiplier. Nevertheless, the subject of macro losses is a murky area, with plenty of disagreement among the experts. Bohi (1986, p. 2) summarizes the state of knowledge on the subject:

> [R]esearch to date has failed to yield clear evidence regarding either the importance of energy or the manner in which changes in energy prices work their influence on economic activity. The literature on this topic reveals wide differences of opinion about the effects of the oil price increases. To cite two prominent extremes, Rasche and Tatum (1981) argue that the economic upheavals of the 1970s are due entirely to energy, while Nordhaus (1980) argues that energy played almost no role. After an empirical evaluation of several possible connections, Darby (1982) concludes that the diversity of empirical results matches the diversity of opinion. Adding to the puzzle is the absence of obvious positive effects resulting from the decline of oil prices in January 1986...

Clearly, there is a range of opinion on how oil prices affect economic performance. At a bare minimum, an objective analysis of an import fee should acknowledge this range of opinion. Ideally, an objective analysis should make a balanced, middle-of-the-road assumption on the extent of macro losses. Hogan (1987, pp. 17-18) describes the range of opinion on macro losses as follows:

> At one end, plausible assumptions, explicit or implicit in other studies, yield little or no cyclical macroeconomic impact of an oil tariff. For example, if the tariff is fully anticipated and the funds recycled, there need be no "surprise" and no aggregate reduction in income. In such an "accomodation" policy, the tariff revenue might be used to avoid an increase in social security taxes, and the domestic oil industry would spend its increased revenue, resulting in no increase in aggregate unemployment.... [At the other extreme] would be the "no accomodation" policy: leave the money supply unaffected and use the tariff revenue to reduce the deficit. The fixed money supply, coupled with the tariff-induced price increases, would maximize the recessionary effect of inflation, producing a contraction in the economy in order to reduce other prices and eliminate all or most of the aggregate price increase.... In this spectrum between frictionless accomodation and no accomodation, the DOE study falls towards the end of no accomodation.

DOE's assumption of virtually no accomodation policy is extremely pessimistic and introduces an unfair bias into the cost-benefit analysis, a bias against oil import fees. The CBO and EMF analyses argue strongly that macro losses can be a short-run phenomenon, and can be minimized with appropriate fiscal and monetary policies (e.g., easing of the money supply, selected tax cuts). In contrast, DOE assumes a fiscal policy of deficit reduction by using import fees to decrease the Federal deficit. Thus DOE is really evaluating two policies together: oil import fees and deficit reduction. This biases the analysis against oil import fees because deficit reduction will likely cause some

macroeconomic losses no matter how it is achieved, whether through spending cuts or tax increases. An unbiased analysis of an oil import fee policy cannot be performed if that policy is coupled to a second policy certain to cause macro losses.

Hogan (1987, p. 18) states this argument eloquently:

> In evaluating an oil tariff,... tying the tariff to deficit reduction is a distraction from the evaluation of energy policy. To the degree that an oil tariff and deficit management are separable, they should be evaluated on their own merits. If an oil tariff is good, because it produces net benefits of $35 billion under a policy of accomodation, and deficit reduction is bad, because it creates $200 billion in macroeconomic loss, then adopt the tariff and live with the deficit. But don't mistake the costs of deficit reduction for the unavoidable costs of an oil tariff.

Hogan provides a thoughtful critique of DOE's macro loss estimate. He recommends that an even-handed approach would be to apply Darby's long-run GNP elasticity multiplier and assume the economy adjusts in one year. This is consistent with Darby's finding of statistically significant estimates of short-run GNP multipliers similar in magnitude to his statistically insignificant long-run estimate. Darby's long-run GNP elasticity estimate, as noted earlier, is 0.021. His four short-run estimates (corresponding to the four quarters of a year) are -0.021, -0.022, -0.009, and -0.018.

Hogan's approach assumes that appropriate fiscal and monetary policies avert some but not all of the macro loss. This treatment of macro losses is adopted in the cost-benefit analysis presented in this paper.

## THE CHOICE OF DISCOUNT RATE

Although the macro loss estimate is the most controversial part of the Energy Security analysis, the choice of discount rate is also worth discussing. A discount rate is used to reduce the magnitude of costs and benefits occurring in the future to reflect the time value of money (i.e., a dollar today is worth more than a dollar one year from now). The bottom line of a cost-benefit analysis can vary significantly with different discount rates, particularly if the time pattern of benefits is substantially different from that of costs.

The DOE report used a real discount rate of 10 percent which is consistent with the longstanding policy of the Office of Management and Budget (OMB, 1972). However, this figure is at the high end of the range of rates that most economists recommend for use in evaluating public sector actions. Lind et al (1982) provides a thorough and wide-ranging examination of the issue of

choosing a discount rate. Lind concludes that for most cost-benefit studies, a discount rate of 4.6 percent is appropriate. Lower rates, he argues, are justified in certain cases involving public investments and particularly long-lived programs. Following Lind's reasoning, a rounded rate of 5 percent (real) is used in the cost-benefit analysis presented in this paper.

## EXPANSION OF DISRUPTION SCENARIOS

The analysis incorporated a third change to the original DOE model by expanding the number of disruption scenarios. The Committee requested that DOE run its models for disruptions in 1988, 1991, and 1995 in order to get a sense of how the cost-benefit analysis changes with the year of disruption. This kind of sensitivity analysis adds to our understanding: if the conclusion of the analysis is roughly the same regardless of the year of the disruption, we can give added weight to a policy recommendation.

## RESULTS OF COMMITTEE STAFF ANALYSIS

So far we have reviewed the questionable assumptions in Energy Security, and presented some alternatives. This section presents the results of the cost-benefit analysis of oil import fees using the alternative assumptions. In the revised analysis, the macro loss is assumed to take place in one year rather than being permanent; the discount rate is 5 percent rather than 10 percent; and disruptions in 1988, 1991, and 1995 are analyzed.

The result is a complete turnaround from the conclusions of Energy Security. The DOE study concluded that the costs of oil import fees substantially exceeded the benefits. With the change in assumptions, the oil import fees examined are estimated to create net benefits to the nation in the tens of billions of dollars. The crucial factor in turning the analysis around is a dramatic drop in macro losses. The results are summarized in the table below; the detailed computer print-outs appear in the Appendix.

NET BENEFITS OF AN OIL IMPORT FEE (BILLIONS OF 1985 DOLLARS)

| Type of Fee | Year of Disruption | | |
|---|---|---|---|
| | 1988 | 1991 | 1995 |
| $5/bbl | 11.9 | 31.0 | 22.3 |
| $10/bbl | 10.3 | 41.6 | 23.8 |
| $24/bbl (variable) | 13.0 | 31.8 | 5.2 |

To illustrate how the analysis changes, consider DOE's estimates for a $10 per barrel fee with a disruption in 1995. The macro loss estimate is $189 billion, welfare loss is $11 billion, total benefits are $45 billion, giving a net benefit of negative $154 billion. With a one-year macro loss assumption and a 5 percent discount rate, the macro loss drops to $24 billion, the welfare loss and total benefits increase slightly (being discounted less heavily), giving a net benefit of $23.8 billion.

A disruption in 1988 means that there are no security benefits -- only a reduction in imports in later years. This is reflected in relatively low net benefits for fees when the disruption is in 1988. Note also the relatively low benefit for a variable fee when the disruption is in 1995. This occurs because the fee drops to zero as world oil prices climb above $24 per barrel.

No cost-benefit analysis can be absolutely definitive or certain. However, this paper demonstrates that DOE used a pessimistic assumption regarding macro losses, one that allows for virtually no fiscal or monetary policies to cushion the impact of oil import fees. This assumption leads one to believe that oil imports are terribly costly to the nation. A very different conclusion is reached if one changes that assumption to a more realistic view, in which government does try to accomodate the price increase with an easing of monetary policy and/or selected tax cuts. With these more realistic assumptions, oil import fees are estimate to provide net benefits measured in the tens of billions of dollars.

As mentioned at the outset, cost-benefit analysis should never be the sole determinant of a policy decision. Non-quantifiable benefits and costs can be equally important in shaping policy. This certainly applies to oil import fees. Benefits include a more independent foreign policy, one that is not unduly influenced by our reliance on imported oil. In addition, an oil import fee will lead to a stronger, more stable domestic petroleum industry, one better able to cope with supply disruptions. Other benefits include a reduction in the U.S. trade deficit and a possible decrease in the probability of a major disruption due to lower U.S. import volumes. Non-quantifiable costs must be considered also. An oil import fee might blunt the drive to lower trading barriers in general among nations. It may also reduce the international competitiveness of certain oil-intensive U.S. products. These factors should be considered along with a fair and balanced cost-benefit analysis as the debate over import fees continues.

## REFERENCES

Bohi, Douglas R., "Energy and Economic Performance: How Important Are Oil Price Shocks?", Energy and Materials Division, Resources for the Future, December 1986.

Congressional Budget Office, "Oil Taxes and the Economy," Staff Memorandum, June 1986.

Darby, Michael R., "The Price of Oil and World Inflation and Recession," American Economic Review, September 1982, pp. 738-751.

Energy Modeling Forum, "Macroeconomic Impacts of Energy Shocks: A Summary of the Key Results," Stanford University, Report EMF 7.2, September 1984 (Revised April 1986).

Hogan, William, "The $200 Billion Surprise: Energy Security and the Oil Tariff," Harvard University Energy and Environmental Policy Center, Report E-87-05, May 1987.

Lind, Robert C., et al, Discounting for Time and Risk in Energy Policy (Washington, D.C.: Resources for the Future, 1982).

Nordhaus, Willian D., "Oil and Economic Performance in Industrial Countries," Brookings Papers on Economic Activity No. 2, 1980, pp. 387-421.

Rasche, Robert F., and John Tatom, "Energy Resources and Potential GNP," Federal Reserve Bank of St. Louis Review, May 1982, pp. 56-61.

U.S. Department of Energy, Energy Projections to the Year 2010, Washington, D.C., Report DOE/PE-0029/2, October 1983.

U.S. Department of Energy, Energy Security: A Report to the President of the United States, Washington, D.C., March 1987.

U.S. Office of Management of Budget, Circular No. A-94 (Revised), Subject: Discount Rates to Be Used in Evaluating Time Distributed Costs and Benefits, March 27, 1972.

Wall Street Journal, "Fed's New Chairman Wins a Lot of Praise on Handling the Crash," November 25, 1987.

## APPENDIX

This appendix contains a summary of the assumption changes in the DOE model made by the Senate Energy Committee staff. Following this are ten pages of model output presenting the results of the revised cost-benefit analysis. The first page presents the original DOE analysis of a $10/bbl fee (disruption in 1995). Following this are the analyses of the nine scenarios listed below:

$5 Fee - Disruption in 1988
$10 Fee - Disruption in 1988
$24 Nominal Floor - Disruption in 1988
$5 Fee - Disruption in 1991
$10 Fee - Disruption in 1991
$24 Nominal Floor - Disruption in 1991
$5 Fee - Disruption in 1995
$10 Fee - Disruption in 1995
$24 Nominal Floor - Disruption in 1995

### SUMMARY OF ASSUMPTION CHANGES

The DOE study calculated macroeconomic adjustment losses with the following formula:

$$\text{Loss} = \text{GNP} - \text{GNP}^{*}(P_f/P_b)^{e}$$

where: GNP = Gross National Product
$P_f$ = Oil price with import fee
$P_b$ = Base oil price (without fee)
$e$ = GNP elasticity multiplier (-0.021)

Using the same approach as Hogan (1987), this study calculated macroeconomic adjustment losses with the following formula:

$$\text{Loss} = \text{GNP} - \text{GNP}^{*}((P_{f,t}/P_{f,t-1})/(P_{b,t}/P_{b,t-1}))^{e}$$

where: t = current year
t-1 = previous year

The DOE study used a real discount rate of 10 percent. This analysis used a rate of 5 percent. Three oil disruption scenarios were examined: 1988, 1991, and 1995. (DOE focuses almost exclusively on 1995.) Finally, the Committee staff examined a variable fee with a $24 per barrel floor rather than a $22 per barrel floor used in Energy Security.

| $10 FEE VS MORE DEPENDENT CASE (Disruption in 1991) (from Energy Security Report, March 1987) | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|
| ASSUMPTIONS: | | | | | | | | | |
| DISRUPTION PROBABILITY | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| DISRUPTION PRICE | | 40.00 | 50.00 | 60.00 | 62.00 | 64.00 | 66.00 | 68.00 | 70.00 |
| CHANGE IN DISRUPTION PRICE | | | | | | | | | 3.10 |
| BAU GNP ELASTICITY | -0.021 | | | | | | | | |
| DISRUPTED GNP ELASTICITY | -0.021 | | | | | | | | |
| MORE DEPENDENT BASE CASE VALUES: | | | | | | | | | |
| WORLD OIL PRICE (1985 DOLLARS) | | 14.49 | 15.00 | 15.49 | 16.69 | 17.90 | 19.10 | 20.31 | 21.51 |
| TOTAL PRODUCTION (MILLION BBL/DAY) | | 9.99 | 9.60 | 9.22 | 8.91 | 8.51 | 8.30 | 7.87 | 7.57 |
| TOTAL PRODUCT SUPPLIED (MILLION BBL/DAY) | | 16.27 | 16.38 | 16.67 | 16.86 | 16.95 | 17.24 | 17.83 | 17.72 |
| NET IMPORTS (MILLION BBL/DAY) | | 6.35 | 6.83 | 7.53 | 8.01 | 8.50 | 9.00 | 10.03 | 10.19 |
| REAL GNP (BILLION 1982 DOLLARS) | | 3906 | 3986 | 4105 | 4239 | 4351 | 4459 | 4572 | 4688 |
| FEE CASE WORLD OIL PRICE | | 13.63 | 13.25 | 13.03 | 13.57 | 14.20 | 15.20 | 16.41 | 17.83 |
| FEE CASE REFINERY ACQUISITION COST (RAC 1985 DOLLARS) | | 23.63 | 23.25 | 23.03 | 23.57 | 24.20 | 25.20 | 26.41 | 27.83 |
| FEE CASE MINUS BASE CASE: | | | | | | | | | |
| 1. CHANGE IN RAC (1985 DOLLARS) | | 9.14 | 8.25 | 7.54 | 6.88 | 6.30 | 6.10 | 6.10 | 6.32 |
| 2. CHANGE IN WOP (1985 DOLLARS) | | -0.86 | -1.75 | -2.46 | -3.12 | -3.70 | -3.90 | -3.90 | -3.68 |
| 3. CHANGE IN PRODUCTION (MILLION BBL/DAY) | | 0.62 | 0.76 | 0.51 | 0.36 | 0.35 | 0.25 | 0.45 | 0.45 |
| 4. CHANGE IN CONSUMPTION (MILLION BBL/DAY) | | -1.02 | -1.07 | -1.03 | -0.99 | -0.92 | -0.97 | -1.36 | -1.08 |
| 5. CHANGE IN IMPORTS (MILLION BBL/DAY) | | -1.81 | -1.84 | -1.54 | -1.33 | -1.27 | -1.22 | -1.81 | -1.52 |
| 6. CHANGE IN IMPORT COST (BILLION 1985 DOLLARS) | | -1.43 | -3.19 | -5.38 | -7.61 | -9.76 | -11.07 | -11.70 | -11.65 |
| 7. WELFARE LOSS (BILLION 1985 DOLLARS) | | -3.02 | -2.77 | -2.12 | -1.67 | -1.46 | -1.36 | -2.01 | -1.75 |
| 8. MACRO LOSS (BILLION 1985 DOLLARS) | | -44.50 | -40.72 | -37.96 | -34.14 | -30.62 | -28.85 | -28.04 | -28.20 |
| 9. SECURITY BENEFIT(BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.69 |
| B. SAVINGS FROM LOWER IMPORTS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.27 |
| C. MACROECONOMIC BENEFITS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.97 |
| 10. GROSS REVENUE FROM FEE (BILLION 1985 DOLLARS) | | 16.57 | 18.21 | 21.86 | 24.38 | 26.39 | 28.40 | 30.00 | 31.65 |
| PRESENT VALUE OF COST AND BENEFITS IN 1987 (BILLION 1985 DOLLARS, DISCOUNT RATE 10%) | | | | | | | | | |
| 11. REDUCTION IN IMPORT COST | 36.92 | 1.30 | 2.63 | 4.04 | 5.20 | 6.06 | 6.25 | 6.00 | 5.43 |
| 12. WELFARE LOSS | -11.29 | -2.74 | -2.29 | -1.59 | -1.14 | -0.91 | -0.77 | -1.03 | -0.82 |
| 13. MACRO LOSS | -188.79 | -40.45 | -33.65 | -28.52 | -23.32 | -19.02 | -16.29 | -14.39 | -13.16 |
| 14. SECURITY BENEFIT (BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | 0.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.79 |
| B. SAVINGS FROM LOWER IMPORTS | 6.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.19 |
| C. MACROECONOMIC BENEFITS | 2.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.32 |
| 15. GROSS REVENUE FROM FEE | 125.77 | 15.06 | 15.05 | 16.43 | 16.65 | 16.39 | 16.03 | 15.40 | 14.76 |
| NET BENEFIT OF OIL IMPORT FEE [11+12+13+14A+14B+14C] | -153.86 | | | | | | | | |

| LOWER PRICE CASE VS $5 FEE CASE - DISRUPTION IN 1988 (revisions by Committee staff) | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|
| ASSUMPTIONS: | | | | | | | | | |
| DISRUPTION PROBABILITY | | 1.00 | | | | | | | |
| DISRUPTION PRICE | | 26.00 | | | | | | | |
| CHANGE IN DISRUPTION PRICE | | 0.00 | | | | | | | |
| BAU GNP ELASTICITY | -0.021 | | | | | | | | |
| DISRUPTED GNP ELASTICITY | -0.021 | | | | | | | | |
| LOWER PRICE BASE CASE VALUES: | | | | | | | | | |
| WORLD OIL PRICE (1985 DOLLARS) | | 14.49 | 15.00 | 15.49 | 16.69 | 17.90 | 19.10 | 20.31 | 21.51 |
| TOTAL PRODUCTION (MILLION BBL/DAY) | | 9.99 | 9.60 | 9.22 | 8.91 | 8.51 | 8.30 | 7.87 | 7.57 |
| TOTAL PRODUCT SUPPLIED (MILLION BBL/DAY) | | 16.27 | 16.38 | 16.67 | 16.86 | 16.95 | 17.24 | 17.83 | 17.72 |
| NET IMPORTS (MILLION BBL/DAY) | | 6.35 | 6.83 | 7.53 | 8.01 | 8.50 | 9.00 | 10.03 | 10.19 |
| REAL GNP (BILLION 1982 DOLLARS) | | 3906 | 3986 | 4105 | 4239 | 4351 | 4459 | 4572 | 4688 |
| FEE CASE WORLD OIL PRICE | | 13.98 | 13.96 | 14.05 | 14.91 | 15.83 | 16.97 | 18.23 | 19.58 |
| FEE CASE REFINERY ACQUISITION COST (RAC 1985 DOLLARS) | | 18.98 | 18.96 | 19.05 | 19.91 | 20.83 | 21.97 | 23.23 | 24.58 |
| FEE CASE MINUS BASE CASE: | | | | | | | | | |
| 1. CHANGE IN RAC (1985 DOLLARS) | | 4.49 | 3.96 | 3.56 | 3.22 | 2.93 | 2.87 | 2.92 | 3.07 |
| 2. CHANGE IN WOP (1985 DOLLARS) | | 0.00 | -1.04 | -1.44 | -1.78 | -2.07 | -2.13 | -2.08 | -1.93 |
| 3. CHANGE IN PRODUCTION (MILLION BBL/DAY) | | 0.30 | 0.36 | 0.24 | 0.18 | 0.17 | 0.13 | 0.24 | 0.23 |
| 4. CHANGE IN CONSUMPTION (MILLION BBL/DAY) | | -0.54 | -0.56 | -0.59 | -0.58 | -0.53 | -0.57 | -0.87 | -0.61 |
| 5. CHANGE IN IMPORTS (MILLION BBL/DAY) | | 0.00 | -0.93 | -0.83 | -0.75 | -0.70 | -0.70 | -1.12 | -0.82 |
| 6. CHANGE IN IMPORT COST (BILLION 1985 DOLLARS) | | 0.00 | -2.24 | -3.52 | -4.72 | -5.89 | -6.45 | -6.76 | -6.60 |
| 7. WELFARE LOSS (BILLION 1985 DOLLARS) | | -0.76 | -0.67 | -0.54 | -0.44 | -0.37 | -0.37 | -0.60 | -0.46 |
| 8. ONE-YEAR MACRO LOSS (BILLION 1985 DOLLARS) | | -24.62 | 3.33 | 2.64 | 3.02 | 2.53 | 1.21 | 0.61 | 0.10 |
| 9. SECURITY BENEFIT (BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| B. SAVINGS FROM LOWER IMPORTS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| C. MACROECONOMIC BENEFITS | | 0.00 | | | | | | | |
| 10. GROSS REVENUE FROM FEE (BILLION 1985 DOLLARS) | | 9.89 | 10.77 | 12.23 | 13.25 | 14.24 | 15.15 | 16.26 | 17.10 |
| PRESENT VALUE OF COST AND BENEFITS IN 1987 (BILLION 1985 DOLLARS, DISCOUNT RATE 5.00%) | Total | | | | | | | | |
| 11. REDUCTION IN IMPORT COST | 27.66 | 0.00 | 2.03 | 3.04 | 3.88 | 4.62 | 4.82 | 4.81 | 4.47 |
| 12. WELFARE LOSS | -3.47 | -0.73 | -0.61 | -0.47 | -0.36 | -0.29 | -0.27 | -0.42 | -0.31 |
| 13. MACRO LOSS | -12.28 | -23.45 | 3.02 | 2.28 | 2.49 | 1.98 | 0.90 | 0.43 | 0.07 |
| 14. SECURITY BENEFIT(BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| B. SAVINGS FROM LOWER IMPORTS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| C. MACROECONOMIC BENEFITS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15. GROSS REVENUE FROM FEE | 86.24 | 9.42 | 9.77 | 10.56 | 10.90 | 11.15 | 11.30 | 11.56 | 11.57 |
| NET BENEFIT OF OIL IMPORT FEE [11+12+13+14A+14B+14C] | 11.92 | | | | | | | | |

| LOWER PRICE CASE VS $10 FEE CASE - DISRUPTION IN 1988 (revisions by Committee staff) | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|
| ASSUMPTIONS: | | | | | | | | | |
| DISRUPTION PROBABILITY | | 1.00 | | | | | | | |
| DISRUPTION PRICE | | 26.00 | | | | | | | |
| CHANGE IN DISRUPTION PRICE | | 0.00 | | | | | | | |
| BAU GNP ELASTICITY | -0.021 | | | | | | | | |
| DISRUPTED GNP ELASTICITY | -0.021 | | | | | | | | |
| LOWER PRICE BASE CASE VALUES: | | | | | | | | | |
| WORLD OIL PRICE (1985 DOLLARS) | | 14.49 | 15.00 | 15.49 | 16.69 | 17.90 | 19.10 | 20.31 | 21.51 |
| TOTAL PRODUCTION (MILLION BBL/DAY) | | 9.99 | 9.60 | 9.22 | 8.91 | 8.51 | 8.30 | 7.87 | 7.57 |
| TOTAL PRODUCT SUPPLIED (MILLION BBL/DAY) | | 16.27 | 16.38 | 16.67 | 16.86 | 16.95 | 17.24 | 17.83 | 17.72 |
| NET IMPORTS (MILLION BBL/DAY) | | 6.35 | 6.83 | 7.53 | 8.01 | 8.50 | 9.00 | 10.03 | 10.19 |
| REAL GNP (BILLION 1982 DOLLARS) | | 3906 | 3986 | 4105 | 4239 | 4351 | 4459 | 4572 | 4688 |
| FEE CASE WORLD OIL PRICE | | 13.63 | 13.25 | 13.03 | 13.57 | 14.20 | 15.20 | 16.41 | 17.83 |
| FEE CASE REFINERY ACQUISITION COST (RAC 1985 DOLLARS) | | 23.63 | 23.25 | 23.03 | 23.57 | 24.20 | 25.20 | 26.41 | 27.83 |
| FEE CASE MINUS BASE CASE: | | | | | | | | | |
| 1. CHANGE IN RAC (1985 DOLLARS) | | 9.14 | 8.25 | 7.54 | 6.88 | 6.30 | 6.10 | 6.10 | 6.32 |
| 2. CHANGE IN WOP (1985 DOLLARS) | | -0.86 | -1.75 | -2.46 | -3.12 | -3.70 | -3.90 | -3.90 | -3.68 |
| 3. CHANGE IN PRODUCTION (MILLION BBL/DAY) | | 0.62 | 0.76 | 0.51 | 0.36 | 0.35 | 0.25 | 0.45 | 0.45 |
| 4. CHANGE IN CONSUMPTION (MILLION BBL/DAY) | | -1.02 | -1.07 | -1.03 | -0.99 | -0.92 | -0.97 | -1.36 | -1.28 |
| 5. CHANGE IN IMPORTS (MILLION BBL/DAY) | | -1.81 | -1.84 | -1.54 | -1.33 | -1.27 | -1.22 | -1.81 | -1.52 |
| 6. CHANGE IN IMPORT COST (BILLION 1985 DOLLARS) | | -1.43 | -3.19 | -5.38 | -7.61 | -9.76 | -11.07 | -11.70 | -11.65 |
| 7. WELFARE LOSS (BILLION 1985 DOLLARS) | | -3.02 | -2.77 | -2.12 | -1.67 | -1.46 | -1.36 | -2.01 | -1.75 |
| 8. ONE-YEAR MACRO LOSS (BILLION 1985 DOLLARS) | | -44.50 | 4.74 | 4.01 | 5.11 | 4.45 | 2.55 | 1.56 | 0.55 |
| 9. SECURITY BENEFIT (BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| B. SAVINGS FROM LOWER IMPORTS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| C. MACROECONOMIC BENEFITS | | 0.00 | | | | | | | |
| 10. GROSS REVENUE FROM FEE (BILLION 1985 DOLLARS) | | 16.57 | 18.21 | 21.86 | 24.38 | 26.39 | 28.40 | 30.00 | 31.65 |
| PRESENT VALUE OF COST AND BENEFITS IN 1987 (BILLION 1985 DOLLARS, DISCOUNT RATE 5.00%) | | Total | | | | | | | |
| 11. REDUCTION IN IMPORT COST | | 47.27 | 1.36 | 2.89 | 4.65 | 6.26 | 7.65 | 8.26 | 8.32 | 7.88 |
| 12. WELFARE LOSS | | -13.37 | -2.88 | -2.51 | -1.83 | -1.37 | -1.14 | -1.01 | -1.43 | -1.19 |
| 13. MACRO LOSS | | -23.55 | -42.38 | 4.30 | 3.46 | 4.20 | 3.48 | 1.90 | 1.11 | 0.37 |
| 14. SECURITY BENEFIT(BILLION 1985 DOLLARS) | | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| B. SAVINGS FROM LOWER IMPORTS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| C. MACROECONOMIC BENEFITS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15. GROSS REVENUE FROM FEE | | 155.86 | 15.78 | 16.52 | 18.89 | 20.06 | 20.68 | 21.19 | 21.32 | 21.42 |
| NET BENEFIT OF OIL IMPORT FEE (11+12+13+14A+14B+14C) | | 10.3448 | | | | | | | | |

| LOWER PRICE CASE VS $24 NOMINAL FLOOR CASE - DISRUPTION IN 1988 (revisions by Committee staff) | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|
| **ASSUMPTIONS:** | | | | | | | | | |
| DISRUPTION PROBABILITY | | 1.00 | | | | | | | |
| DISRUPTION PRICE | | 26.00 | | | | | | | |
| CHANGE IN DISRUPTION PRICE | | 0.00 | | | | | | | |
| PRICE EXCLUDING TARIFF | | 13.71 | 13.51 | 13.50 | 14.39 | 15.81 | 18.02 | 19.81 | 21.91 |
| BAU GNP ELASTICITY | -0.021 | | | | | | | | |
| DISRUPTED GNP ELASTICITY | -0.021 | | | | | | | | |
| LOWER PRICE BASE CASE VALUES: | | | | | | | | | |
| WORLD OIL PRICE (1985 DOLLARS) | | 14.49 | 15.00 | 15.49 | 16.69 | 17.90 | 19.10 | 20.31 | 21.51 |
| TOTAL PRODUCTION (MILLION BBL/DAY) | | 9.99 | 9.60 | 9.22 | 8.91 | 8.51 | 8.30 | 7.87 | 7.57 |
| TOTAL PRODUCT SUPPLIED (MILLION BBL/DAY) | | 16.27 | 16.38 | 16.67 | 16.86 | 16.95 | 17.24 | 17.83 | 17.72 |
| NET IMPORTS (MILLION BBL/DAY) | | 6.35 | 6.83 | 7.53 | 8.01 | 8.50 | 9.00 | 10.03 | 10.19 |
| REAL GNP (BILLION 1982 DOLLARS) | | 3906 | 3986 | 4105 | 4239 | 4351 | 4459 | 4572 | 4688 |
| FLOOR CASE WORLD OIL PRICE | | 13.71 | 13.51 | 13.50 | 14.39 | 15.81 | 18.02 | 19.81 | 21.91 |
| FLOOR CASE REFINERY ACQUISITION COST | | 21.81 | 20.91 | 20.04 | 19.20 | 18.34 | 18.02 | 19.81 | 21.91 |
| FLOOR CASE MINUS BASE CASE: | | | | | | | | | |
| 1. CHANGE IN RAC (1985 DOLLARS) | | 7.32 | 5.91 | 4.55 | 2.51 | 0.44 | -1.08 | -0.50 | 0.40 |
| 2. CHANGE IN WOP (1985 DOLLARS) | | -0.78 | -1.49 | -1.99 | -2.30 | -2.09 | -1.08 | -0.50 | 0.40 |
| 3. CHANGE IN PRODUCTION (MILLION BBL/DAY) | | 0.35 | 0.45 | 0.50 | 0.38 | 0.26 | 0.05 | 0.06 | 0.04 |
| 4. CHANGE IN CONSUMPTION (MILLION BBL/DAY) | | -0.88 | -0.83 | -0.77 | -0.59 | -0.34 | -0.02 | -0.25 | -0.14 |
| 5. CHANGE IN IMPORTS (MILLION BBL/DAY) | | -1.38 | -1.28 | -1.27 | -0.93 | -0.56 | -0.03 | -0.32 | -0.18 |
| 6. CHANGE IN IMPORT COST (BILLION 1985 DOLLARS) | | -1.41 | -3.02 | -4.55 | -5.94 | -6.06 | -3.54 | -1.77 | 1.46 |
| 7. WELFARE LOSS (BILLION 1985 DOLLARS) | | -1.84 | -1.38 | -1.05 | -0.43 | -0.04 | 0.01 | 0.03 | -0.01 |
| 8. ONE-YEAR MACRO LOSS (BILLION 1985 DOLLARS) | | -37.24 | 7.17 | 7.18 | 11.67 | 11.81 | 8.62 | -3.56 | -4.76 |
| 9. SECURITY BENEFIT (BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| B. SAVINGS FROM LOWER IMPORTS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| C. MACROECONOMIC BENEFITS | | 0.00 | | | | | | | |
| 10. GROSS REVENUE FROM FEE (BILLION 1985 DOLLARS) | | 14.69 | 14.99 | 14.94 | 12.43 | 7.33 | 0.00 | 0.00 | 0.00 |
| PRESENT VALUE OF COST AND BENEFIT IN 1987 (BILLION 1985 DOLLARS, DISCOUNT RATE 5.00%) | | Total | | | | | | | |
| 11. REDUCTION IN IMPORT COST | | 20.56 | 1.35 | 2.74 | 3.93 | 4.89 | 4.75 | 2.64 | 1.26 | -0.99 |
| 12. WELFARE LOSS | | -4.29 | -1.76 | -1.25 | -0.91 | -0.35 | -0.04 | 0.00 | 0.02 | -0.01 |
| 13. MACRO LOSS | | -3.22 | -35.47 | 6.50 | 6.20 | 9.60 | 9.26 | 6.43 | -2.53 | -3.22 |
| 14. SECURITY BENEFIT | | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| B. SAVINGS FROM LOWER IMPORTS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| C. MACROECONOMIC BENEFITS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15. GROSS REVENUE FROM FEE | | 56.47 | 13.99 | 13.60 | 12.91 | 10.23 | 5.74 | 0.00 | 0.00 | 0.00 |
| NET BENEFIT OF OIL IMPORT FEE [11+12+13+14A+14B+14C] | | 13.05 | | | | | | | | |

| LOWER PRICE CASE VS $5 FEE CASE - DISRUPTION IN 1991 (revisions by Committee staff) | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|
| ASSUMPTIONS: | | | | | | | | | |
| DISRUPTION PROBABILITY | | | | | 1.00 | | | | |
| DISRUPTION PRICE | | | | | 61.00 | | | | |
| CHANGE IN DISRUPTION PRICE | | | | | 7.32 | | | | |
| BAU GNP ELASTICITY | -0.021 | | | | | | | | |
| DISRUPTED GNP ELASTICITY | -0.021 | | | | | | | | |
| LOWER PRICE BASE CASE VALUES: | | | | | | | | | |
| WORLD OIL PRICE (1985 DOLLARS) | | 14.49 | 15.00 | 15.49 | 16.69 | 17.90 | 19.10 | 20.31 | 21.51 |
| TOTAL PRODUCTION (MILLION BBL/DAY) | | 9.99 | 9.60 | 9.22 | 8.91 | 8.51 | 8.30 | 7.87 | 7.57 |
| TOTAL PRODUCT SUPPLIED (MILLION BBL/DAY) | | 16.27 | 16.38 | 16.67 | 16.86 | 16.95 | 17.24 | 17.83 | 17.72 |
| NET IMPORTS (MILLION BBL/DAY) | | 6.35 | 6.83 | 7.53 | 8.01 | 8.50 | 9.00 | 10.03 | 10.19 |
| REAL GNP (BILLION 1982 DOLLARS) | | 3906 | 3986 | 4105 | 4239 | 4351 | 4459 | 4572 | 4688 |
| FEE CASE WORLD OIL PRICE | | 13.98 | 13.96 | 14.05 | 14.91 | 15.83 | 16.97 | 18.23 | 19.58 |
| FEE CASE REFINERY ACQUISITION COST (RAC 1985 DOLLARS) | | 18.98 | 18.96 | 19.05 | 19.91 | 20.83 | 21.97 | 23.23 | 24.58 |
| FEE CASE MINUS BASE CASE: | | | | | | | | | |
| 1. CHANGE IN RAC (1985 DOLLARS) | | 4.49 | 3.96 | 3.56 | 3.22 | 2.93 | 2.87 | 2.92 | 3.07 |
| 2. CHANGE IN WOP (1985 DOLLARS) | | -0.51 | -1.04 | -1.44 | -1.78 | -2.07 | -2.13 | -2.08 | -1.93 |
| 3. CHANGE IN PRODUCTION (MILLION BBL/DAY) | | 0.30 | 0.36 | 0.24 | 0.18 | 0.17 | 0.13 | 0.24 | 0.23 |
| 4. CHANGE IN CONSUMPTION (MILLION BBL/DAY) | | -0.54 | -0.56 | -0.59 | -0.58 | -0.53 | -0.57 | -0.87 | -0.61 |
| 5. CHANGE IN IMPORTS (MILLION BBL/DAY) | | -0.93 | -0.93 | -0.83 | -0.75 | -0.70 | -0.70 | -1.12 | -0.82 |
| 6. CHANGE IN IMPORT COST (BILLION 1985 DOLLARS) | | -1.01 | -2.24 | -3.52 | -4.72 | -5.89 | -6.45 | -6.76 | -6.60 |
| 7. WELFARE LOSS (BILLION 1985 DOLLARS) | | -0.76 | -0.67 | -0.54 | -0.44 | -0.37 | -0.37 | -0.60 | -0.46 |
| 8. ONE-YEAR MACRO LOSS (BILLION 1985 DOLLARS) | | -24.62 | 3.33 | 2.64 | 3.02 | 2.53 | 1.21 | 0.61 | 0.10 |
| 9. SECURITY BENEFIT (BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 0.00 | 0.00 | 0.00 | 3.35 | 0.00 | 0.00 | 0.00 | 0.00 |
| B. SAVINGS FROM LOWER IMPORTS | | 0.00 | 0.00 | 0.00 | 5.98 | 0.00 | 0.00 | 0.00 | 0.00 |
| C. MACROECONOMIC BENEFITS | | | | | 12.71 | | | | |
| 10. GROSS REVENUE FROM FEE (BILLION 1985 DOLLARS) | | 9.89 | 10.77 | 12.23 | 13.25 | 14.24 | 15.15 | 16.26 | 17.10 |
| PRESENT VALUE OF COST AND BENEFITS IN 1987 (BILLION 1985 DOLLARS, DISCOUNT RATE 5.00%) | | Total | | | | | | | |
| 11. REDUCTION IN IMPORT COST | | 28.62 | 0.96 | 2.03 | 3.04 | 3.88 | 4.62 | 4.82 | 4.81 | 4.47 |
| 12. WELFARE LOSS | | -3.47 | -0.73 | -0.61 | -0.47 | -0.36 | -0.29 | -0.27 | -0.42 | -0.31 |
| 13. MACRO LOSS | | -12.28 | -23.45 | 3.02 | 2.28 | 2.49 | 1.98 | 0.90 | 0.43 | 0.07 |
| 14. SECURITY BENEFIT (BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 2.75 | 0.00 | 0.00 | 0.00 | 2.75 | 0.00 | 0.00 | 0.00 | 0.00 |
| B. SAVINGS FROM LOWER IMPORTS | | 4.92 | 0.00 | 0.00 | 0.00 | 4.92 | 0.00 | 0.00 | 0.00 | 0.00 |
| C. MACROECONOMIC BENEFITS | | 10.45 | 0.00 | 0.00 | 0.00 | 10.45 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15. GROSS REVENUE FRC. FEE | | 86.24 | 9.42 | 9.77 | 10.56 | 10.90 | 11.15 | 11.30 | 11.56 | 11.57 |
| NET BENEFIT OF OIL IMPORT FEE [11+12+13+14A+14B+14C] | | 31.01 | | | | | | | |

LOWER PRICE CASE VS $10 FEE CASE - DISRUPTION IN 1991
(revisions by Committee staff)

| | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|
| ASSUMPTIONS: | | | | | | | | | |
| DISRUPTION PROBABILITY | | | | | 1.00 | | | | |
| DISRUPTION PRICE | | | | | 61.00 | | | | |
| CHANGE IN DISRUPTION PRICE | | | | | 12.23 | | | | |
| BAU GNP ELASTICITY | -0.021 | | | | | | | | |
| DISRUPTED GNP ELASTICITY | -0.021 | | | | | | | | |
| LOWER PRICE BASE CASE VALUES: | | | | | | | | | |
| WORLD OIL PRICE (1985 DOLLARS) | | 14.49 | 15.00 | 15.49 | 16.69 | 17.90 | 19.10 | 20.31 | 21.51 |
| TOTAL PRODUCTION (MILLION BBL/DAY) | | 9.99 | 9.60 | 9.22 | 8.91 | 8.51 | 8.30 | 7.87 | 7.57 |
| TOTAL PRODUCT SUPPLIED (MILLION BBL/DAY) | | 16.27 | 16.38 | 16.67 | 16.86 | 16.95 | 17.24 | 17.83 | 17.72 |
| NET IMPORTS (MILLION BBL/DAY) | | 6.35 | 6.83 | 7.53 | 8.01 | 8.50 | 9.00 | 10.03 | 10.19 |
| REAL GNP (BILLION 1982 DOLLARS) | | 3906 | 3986 | 4105 | 4239 | 4351 | 4459 | 4572 | 4688 |
| FEE CASE WORLD OIL PRICE | | 13.63 | 13.25 | 13.03 | 13.57 | 14.20 | 15.20 | 16.41 | 17.83 |
| FEE CASE REFINERY ACQUISITION COST (RAC 1985 DOLLARS) | | 23.63 | 23.25 | 23.03 | 23.57 | 24.20 | 25.20 | 26.41 | 27.83 |
| FEE CASE MINUS BASE CASE: | | | | | | | | | |
| 1. CHANGE IN RAC (1985 DOLLARS) | | 9.14 | 8.25 | 7.54 | 6.88 | 6.30 | 6.10 | 6.10 | 6.32 |
| 2. CHANGE IN WOP (1985 DOLLARS) | | -0.86 | -1.75 | -2.46 | -3.12 | -3.70 | -3.90 | -3.90 | -3.68 |
| 3. CHANGE IN PRODUCTION (MILLION BBL/DAY) | | 0.62 | 0.76 | 0.51 | 0.36 | 0.35 | 0.25 | 0.45 | 0.45 |
| 4. CHANGE IN CONSUMPTION (MILLION BBL/DAY) | | -1.02 | -1.07 | -1.03 | -0.99 | -0.92 | -0.97 | -1.36 | -1.08 |
| 5. CHANGE IN IMPORTS (MILLION BBL/DAY) | | -1.81 | -1.84 | -1.54 | -1.33 | -1.27 | -1.22 | -1.81 | -1.52 |
| 6. CHANGE IN IMPORT COST (BILLION 1985 DOLLARS) | | -1.43 | -3.19 | -5.38 | -7.61 | -9.76 | -11.07 | -11.70 | -11.65 |
| 7. WELFARE LOSS (BILLION 1985 DOLLARS) | | -3.02 | -2.77 | -2.12 | -1.67 | -1.46 | -1.36 | -2.01 | -1.75 |
| 8. ONE-YEAR MACRO LOSS (BILLION 1985 DOLLARS) | | -44.50 | 4.74 | 4.01 | 5.11 | 4.45 | 2.55 | 1.56 | 0.55 |
| 9. SECURITY BENEFIT (BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 0.00 | 0.00 | 0.00 | 5.15 | 0.00 | 0.00 | 0.00 | 0.00 |
| B. SAVINGS FROM LOWER IMPORTS | | 0.00 | 0.00 | 0.00 | 10.61 | 0.00 | 0.00 | 0.00 | 0.00 |
| C. MACROECONOMIC BENEFITS | | | | | 22.26 | | | | |
| 10. GROSS REVENUE FROM FEE (BILLION 1985 DOLLARS) | | 16.57 | 18.21 | 21.86 | 24.38 | 26.39 | 28.40 | 30.00 | 31.65 |
| PRESENT VALUE OF COST AND BENEFITS IN 1987 (BILLION 1985 DOLLARS, DISCOUNT RATE 5.00%) | Total | | | | | | | | |
| 11. REDUCTION IN IMPORT COST | 47.27 | 1.36 | 2.89 | 4.65 | 6.26 | 7.65 | 8.26 | 8.32 | 7.88 |
| 12. WELFARE LOSS | -13.37 | -2.88 | -2.51 | -1.83 | -1.37 | -1.14 | -1.01 | -1.43 | -1.19 |
| 13. MACRO LOSS | -23.55 | -42.38 | 4.30 | 3.46 | 4.20 | 3.48 | 1.90 | 1.11 | 0.37 |
| 14. SECURITY BENEFIT (BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | 4.23 | 0.00 | 0.00 | 0.00 | 4.23 | 0.00 | 0.00 | 0.00 | 0.00 |
| B. SAVINGS FROM LOWER IMPORTS | 8.73 | 0.00 | 0.00 | 0.00 | 8.73 | 0.00 | 0.00 | 0.00 | 0.00 |
| C. MACROECONOMIC BENEFITS | 18.31 | 0.00 | 0.00 | 0.00 | 18.31 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15. GROSS REVENUE FROM FEE | 155.86 | 15.78 | 16.52 | 18.89 | 20.06 | 20.68 | 21.19 | 21.32 | 21.42 |
| NET BENEFIT OF OIL IMPORT FEE [11+12+13+14A+14B+14C] | 41.62 | | | | | | | | |

LOWER PRICE CASE VS $24 NOMINAL FLOOR CASE - DISRUPTION IN 1991
(revisions by Committee staff)

| | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|
| ASSUMPTIONS: | | | | | | | | | |
| DISRUPTION PROBABILITY | | | | | 1.00 | | | | |
| DISRUPTION PRICE | | | | | 61.00 | | | | |
| CHANGE IN DISRUPTION PRICE | | | | | 7.04 | | | | |
| PRICE EXCLUDING TARIFF | | 13.71 | 13.51 | 13.50 | 14.39 | 15.81 | 18.02 | 19.81 | 21.91 |
| BAU GNP ELASTICITY | -0.021 | | | | | | | | |
| DISRUPTED GNP ELASTICITY | -0.021 | | | | | | | | |
| LOWER PRICE BASE CASE VALUES: | | | | | | | | | |
| WORLD OIL PRICE (1985 DOLLARS) | | 14.49 | 15.00 | 15.49 | 16.69 | 17.90 | 19.10 | 20.31 | 21.51 |
| TOTAL PRODUCTION (MILLION BBL/DAY) | | 9.99 | 9.60 | 9.22 | 8.91 | 8.51 | 8.30 | 7.87 | 7.57 |
| TOTAL PRODUCT SUPPLIED (MILLION BBL/DAY) | | 16.27 | 16.38 | 16.67 | 16.86 | 16.95 | 17.24 | 17.83 | 17.72 |
| NET IMPORTS (MILLION BBL/DAY) | | 6.35 | 6.83 | 7.53 | 8.01 | 8.50 | 9.00 | 10.03 | 10.19 |
| REAL GNP (BILLION 1982 DOLLARS) | | 3906 | 3986 | 4105 | 4239 | 4351 | 4459 | 4572 | 4688 |
| FLOOR CASE WORLD OIL PRICE | | 13.71 | 13.51 | 13.50 | 14.39 | 15.81 | 18.02 | 19.81 | 21.91 |
| FLOOR CASE REFINERY ACQUISITION COST | | 21.81 | 20.91 | 20.04 | 19.20 | 18.34 | 18.02 | 19.81 | 21.91 |
| FLOOR CASE MINUS BASE CASE: | | | | | | | | | |
| 1. CHANGE IN RAC (1985 DOLLARS) | | 7.32 | 5.91 | 4.55 | 2.51 | 0.44 | -1.08 | -0.50 | 0.40 |
| 2. CHANGE IN WOP (1985 DOLLARS) | | -0.78 | -1.49 | -1.99 | -2.30 | -2.09 | -1.08 | -0.50 | 0.40 |
| 3. CHANGE IN PRODUCTION (MILLION BBL/DAY) | | 0.35 | 0.45 | 0.50 | 0.38 | 0.26 | 0.05 | 0.06 | 0.04 |
| 4. CHANGE IN CONSUMPTION (MILLION BBL/DAY) | | -0.88 | -0.83 | -0.77 | -0.59 | -0.34 | -0.02 | -0.25 | -0.14 |
| 5. CHANGE IN IMPORTS (MILLION BBL/DAY) | | -1.38 | -1.28 | -1.27 | -0.93 | -0.56 | -0.03 | -0.32 | -0.18 |
| 6. CHANGE IN IMPORT COST (BILLION 1985 DOLLARS) | | -1.41 | -3.02 | -4.55 | -5.94 | -6.06 | -3.54 | -1.77 | 1.46 |
| 7. WELFARE LOSS (BILLION 1985 DOLLARS) | | -1.84 | -1.38 | -1.05 | -0.43 | -0.04 | 0.01 | 0.03 | -0.01 |
| 8. ONE-YEAR MACRO LOSS (BILLION 1985 DOLLARS) | | -37.24 | 7.17 | 7.18 | 11.67 | 11.81 | 8.62 | -3.56 | -4.76 |
| 9. SECURITY BENEFIT (BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 0.00 | 0.00 | 0.00 | 3.14 | 0.00 | 0.00 | 0.00 | 0.00 |
| B. SAVINGS FROM LOWER IMPORTS | | 0.00 | 0.00 | 0.00 | 7.42 | 0.00 | 0.00 | 0.00 | 0.00 |
| C. MACROECONOMIC BENEFITS | | | | | 12.19 | | | | |
| 10. GROSS REVENUE FROM FEE (BILLION 1985 DOLLARS) | | 14.69 | 14.99 | 14.94 | 12.43 | 7.33 | 0.00 | 0.00 | 0.00 |
| PRESENT VALUE OF COST AND BENEFIT IN 1987 (BILLION 1985 DOLLARS, DISCOUNT RATE 5.00%) | | Total | | | | | | | |
| 11. REDUCTION IN IMPORT COST | | 20.56 | 1.35 | 2.74 | 3.93 | 4.89 | 4.75 | 2.64 | 1.26 | -0.99 |
| 12. WELFARE LOSS | | -4.29 | -1.76 | -1.25 | -0.91 | -0.35 | -0.04 | 0.00 | 0.02 | -0.01 |
| 13. MACRO LOSS | | -3.22 | -35.47 | 6.50 | 6.20 | 9.60 | 9.26 | 6.43 | -2.53 | -3.22 |
| 14. SECURITY BENEFIT | | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 2.58 | 0.00 | 0.00 | 0.00 | 2.58 | 0.00 | 0.00 | 0.00 | 0.00 |
| B. SAVINGS FROM LOWER IMPORTS | | 6.10 | 0.00 | 0.00 | 0.00 | 6.10 | 0.00 | 0.00 | 0.00 | 0.00 |
| C. MACROECONOMIC BENEFITS | | 10.03 | 0.00 | 0.00 | 0.00 | 10.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15. GROSS REVENUE FROM FEE | | 56.47 | 13.99 | 13.60 | 12.91 | 10.23 | 5.74 | 0.00 | 0.00 | 0.00 |
| NET BENEFIT OF OIL IMPORT FEE [11+12+13+14A+14B+14C] | | 31.76 | | | | | | | | |

LOWER PRICE CASE VS $5 FEE CASE - DISRUPTION IN 1995
(revisions by Committee staff)

| | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|
| ASSUMPTIONS: | | | | | | | | | |
| DISRUPTION PROBABILITY | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| DISRUPTION PRICE | | 40.00 | 50.00 | 60.00 | 62.00 | 64.00 | 66.00 | 68.00 | 70.00 |
| CHANGE IN DISRUPTION PRICE | | | | | | | | | 3.10 |
| BAU GNP ELASTICITY | -0.021 | | | | | | | | |
| DISRUPTED GNP ELASTICITY | -0.021 | | | | | | | | |
| MORE DEPENDENT BASE CASE VALUES: | | | | | | | | | |
| WORLD OIL PRICE (1985 DOLLARS) | | 14.49 | 15.00 | 15.49 | 16.69 | 17.90 | 19.10 | 20.31 | 21.51 |
| TOTAL PRODUCTION (MILLION BBL/DAY) | | 9.99 | 9.60 | 9.22 | 8.91 | 8.51 | 8.30 | 7.87 | 7.57 |
| TOTAL PRODUCT SUPPLIED (MILLION BBL/DAY) | | 16.27 | 16.38 | 16.67 | 16.86 | 16.95 | 17.24 | 17.83 | 17.72 |
| NET IMPORTS (MILLION BBL/DAY) | | 6.35 | 6.83 | 7.53 | 8.01 | 8.50 | 9.00 | 10.03 | 10.19 |
| REAL GNP (BILLION 1982 DOLLARS) | | 3906 | 3986 | 4105 | 4239 | 4351 | 4459 | 4572 | 4688 |
| FEE CASE WORLD OIL PRICE | | 13.98 | 13.96 | 14.05 | 14.91 | 15.83 | 16.97 | 18.23 | 19.58 |
| FEE CASE REFINERY ACQUISITION COST (RAC 1985 DOLLARS) | | 18.98 | 18.96 | 19.05 | 19.91 | 20.83 | 21.97 | 23.23 | 24.58 |
| FEE CASE MINUS BASE CASE: | | | | | | | | | |
| 1. CHANGE IN RAC (1985 DOLLARS) | | 4.49 | 3.96 | 3.56 | 3.22 | 2.93 | 2.87 | 2.92 | 3.07 |
| 2. CHANGE IN WOP (1985 DOLLARS) | | -0.51 | -1.04 | -1.44 | -1.78 | -2.07 | -2.13 | -2.08 | -1.93 |
| 3. CHANGE IN PRODUCTION (MILLION BBL/DAY) | | 0.30 | 0.36 | 0.24 | 0.18 | 0.17 | 0.13 | 0.24 | 0.23 |
| 4. CHANGE IN CONSUMPTION (MILLION BBL/DAY) | | -0.54 | -0.56 | -0.59 | -0.58 | -0.53 | -0.57 | -0.87 | -0.61 |
| 5. CHANGE IN IMPORTS (MILLION BBL/DAY) | | -0.93 | -0.93 | -0.83 | -0.75 | -0.70 | -0.70 | -1.12 | -0.82 |
| 6. CHANGE IN IMPORT COST (BILLION 1985 DOLLARS) | | -1.01 | -2.24 | -3.52 | -4.72 | -5.89 | -6.45 | -6.76 | -6.60 |
| 7. WELFARE LOSS (BILLION 1985 DOLLARS) | | -0.76 | -0.67 | -0.54 | -0.44 | -0.37 | -0.37 | -0.60 | -0.46 |
| 8. ONE-YEAR MACRO LOSS (BILLION 1985 DOLLARS) | | -24.62 | 3.33 | 2.64 | 3.02 | 2.53 | 1.21 | 0.61 | 0.10 |
| 9. SECURITY BENEFIT(BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.83 |
| B. SAVINGS FROM LOWER IMPORTS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.16 |
| C. MACROECONOMIC BENEFITS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.97 |
| 10. GROSS REVENUE FROM FEE (BILLION 1985 DOLLARS) | | 9.89 | 10.77 | 12.23 | 13.25 | 14.24 | 15.15 | 16.26 | 17.10 |
| PRESENT VALUE OF COST AND BENEFITS IN 1987 (BILLION 1985 DOLLARS, DISCOUNT RATE 5.00%) | Total | | | | | | | | |
| 11. REDUCTION IN IMPORT COST | 28.62 | 0.96 | 2.03 | 3.04 | 3.88 | 4.62 | 4.82 | 4.81 | 4.47 |
| 12. WELFARE LOSS | -3.47 | -0.73 | -0.61 | -0.47 | -0.36 | -0.29 | -0.27 | -0.42 | -0.31 |
| 13. MACRO LOSS | -12.28 | -23.45 | 3.02 | 2.28 | 2.49 | 1.98 | 0.90 | 0.43 | 0.07 |
| 14. SECURITY BENEFIT (BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | 1.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.24 |
| B. SAVINGS FROM LOWER IMPORTS | 4.84 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.84 |
| C. MACROECONOMIC BENEFITS | 3.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.37 |
| 15. GROSS REVENUE FROM FEE | 86.24 | 9.42 | 9.77 | 10.56 | 10.90 | 11.15 | 11.30 | 11.56 | 11.57 |
| NET BENEFIT OF OIL IMPORT FEE [11+12+13+14A+14B+14C] | 22.33 | | | | | | | | |

LOWER PRICE CASE VS $10 FEE CASE - DISRUPTION IN 1995
(revisions by Committee staff)

| | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|
| ASSUMPTIONS: | | | | | | | | | |
| DISRUPTION PROBABILITY | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| DISRUPTION PRICE | | 40.00 | 50.00 | 60.00 | 62.00 | 64.00 | 66.00 | 68.00 | 70.00 |
| CHANGE IN DISRUPTION PRICE | | | | | | | | | 3.10 |
| BAU GNP ELASTICITY | -0.021 | | | | | | | | |
| DISRUPTED GNP ELASTICITY | -0.021 | | | | | | | | |
| MORE DEPENDENT BASE CASE VALUES: | | | | | | | | | |
| WORLD OIL PRICE (1985 DOLLARS) | | 14.49 | 15.00 | 15.49 | 16.69 | 17.90 | 19.10 | 20.31 | 21.51 |
| TOTAL PRODUCTION (MILLION BBL/DAY) | | 9.99 | 9.60 | 9.22 | 8.91 | 8.51 | 8.30 | 7.87 | 7.57 |
| TOTAL PRODUCT SUPPLIED (MILLION BBL/DAY) | | 16.27 | 16.38 | 16.67 | 16.86 | 16.95 | 17.24 | 17.83 | 17.72 |
| NET IMPORTS (MILLION BBL/DAY) | | 6.35 | 6.83 | 7.53 | 8.01 | 8.50 | 9.00 | 10.03 | 10.19 |
| REAL GNP (BILLION 1982 DOLLARS) | | 3906 | 3986 | 4105 | 4239 | 4351 | 4459 | 4572 | 4688 |
| FEE CASE WORLD OIL PRICE | | 13.63 | 13.25 | 13.03 | 13.57 | 14.20 | 15.20 | 16.41 | 17.83 |
| FEE CASE REFINERY ACQUISITION COST (RAC 1985 DOLLARS) | | 23.63 | 23.25 | 23.03 | 23.57 | 24.20 | 25.20 | 26.41 | 27.83 |
| FEE CASE MINUS BASE CASE: | | | | | | | | | |
| 1. CHANGE IN RAC (1985 DOLLARS) | | 9.14 | 8.25 | 7.54 | 6.88 | 6.30 | 6.10 | 6.10 | 6.32 |
| 2. CHANGE IN WOP (1985 DOLLARS) | | -0.86 | -1.75 | -2.46 | -3.12 | -3.70 | -3.90 | -3.90 | -3.68 |
| 3. CHANGE IN PRODUCTION (MILLION BBL/DAY) | | 0.62 | 0.76 | 0.51 | 0.36 | 0.35 | 0.25 | 0.45 | 0.45 |
| 4. CHANGE IN CONSUMPTION (MILLION BBL/DAY) | | -1.02 | -1.07 | -1.03 | -0.99 | -0.92 | -0.97 | -1.36 | -1.08 |
| 5. CHANGE IN IMPORTS (MILLION BBL/DAY) | | -1.81 | -1.84 | -1.54 | -1.33 | -1.27 | -1.22 | -1.81 | -1.52 |
| 6. CHANGE IN IMPORT COST (BILLION 1985 DOLLARS) | | -1.43 | -3.19 | -5.38 | -7.61 | -9.76 | -11.07 | -11.70 | -11.65 |
| 7. WELFARE LOSS (BILLION 1985 DOLLARS) | | -3.02 | -2.77 | -2.12 | -1.67 | -1.46 | -1.36 | -2.01 | -1.75 |
| 8. ONE-YEAR MACRO LOSS (BILLION 1985 DOLLARS) | | -44.50 | 4.74 | 4.01 | 5.11 | 4.45 | 2.55 | 1.56 | 0.55 |
| 9. SECURITY BENEFIT(BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.69 |
| B. SAVINGS FROM LOWER IMPORTS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.27 |
| C. MACROECONOMIC BENEFITS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.97 |
| 10. GROSS REVENUE FROM FEE (BILLION 1985 DOLLARS) | | 16.57 | 18.21 | 21.86 | 24.38 | 26.39 | 28.40 | 30.00 | 31.65 |
| PRESENT VALUE OF COST AND BENEFITS IN 1987 (BILLION 1985 DOLLARS, DISCOUNT RATE 5.00%) | | | | | | | | | |
| | Total | | | | | | | | |
| 11. REDUCTION IN IMPORT COST | 47.27 | 1.36 | 2.89 | 4.65 | 6.26 | 7.65 | 8.26 | 8.32 | 7.88 |
| 12. WELFARE LOSS | -13.37 | -2.88 | -2.51 | -1.83 | -1.37 | -1.14 | -1.01 | -1.63 | -1.19 |
| 13. MACRO LOSS | -23.55 | -42.38 | 4.30 | 3.46 | 4.20 | 3.48 | 1.90 | 1.11 | 0.37 |
| 14. SECURITY BENEFIT(BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.15 |
| B. SAVINGS FROM LOWER IMPORTS | 8.98 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.98 |
| C. MACROECONOMIC BENEFITS | 3.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.37 |
| 15. GROSS REVENUE FROM FEE | 155.86 | 15.78 | 16.52 | 18.89 | 20.06 | 20.68 | 21.19 | 21.32 | 21.42 |
| NET BENEFIT OF OIL IMPORT FEE [11+12+13+14A+14B+14C] | 23.84 | | | | | | | | |

LOWER PRICE CASE VS $24 NOMINAL FLOOR CASE -- DISRUPTION IN 1995
(revisions by Committee staff)

| | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|
| ASSUMPTIONS: | | | | | | | | | |
| DISRUPTION PROBABILITY | | | | | | | | | 1.00 |
| DISRUPTION PRICE | | | | | | | | | 72.00 |
| CHANGE IN DISRUPTION PRICE | | | | | | | | | -6.32 |
| PRICE EXCLUDING TARIFF | | 13.71 | 13.51 | 13.50 | 14.39 | 15.81 | 18.02 | 19.81 | 21.91 |
| BAU GNP ELASTICITY | -0.021 | | | | | | | | |
| DISRUPTED GNP ELASTICITY | -0.021 | | | | | | | | |
| LOWER PRICE BASE CASE VALUES: | | | | | | | | | |
| WORLD OIL PRICE (1985 DOLLARS) | | 14.49 | 15.00 | 15.49 | 16.69 | 17.90 | 19.10 | 20.31 | 21.51 |
| TOTAL PRODUCTION (MILLION BBL/DAY) | | 9.99 | 9.60 | 9.22 | 8.91 | 8.51 | 8.30 | 7.87 | 7.57 |
| TOTAL PRODUCT SUPPLIED (MILLION BBL/DAY) | | 16.27 | 16.38 | 16.67 | 16.86 | 16.95 | 17.24 | 17.83 | 17.72 |
| NET IMPORTS (MILLION BBL/DAY) | | 6.35 | 6.83 | 7.53 | 8.01 | 8.50 | 9.00 | 10.03 | 10.19 |
| REAL GNP (BILLION 1982 DOLLARS) | | 3906 | 3986 | 4105 | 4239 | 4351 | 4459 | 4572 | 4688 |
| FLOOR CASE WORLD OIL PRICE | | 13.71 | 13.51 | 13.50 | 14.39 | 15.81 | 18.02 | 19.81 | 21.91 |
| FLOOR CASE REFINERY ACQUISITION COST | | 21.81 | 20.91 | 20.04 | 19.20 | 18.34 | 18.02 | 19.81 | 21.91 |
| FLOOR CASE MINUS BASE CASE: | | | | | | | | | |
| 1. CHANGE IN RAC (1985 DOLLARS) | | 7.32 | 5.91 | 4.55 | 2.51 | 0.44 | -1.08 | -0.50 | 0.40 |
| 2. CHANGE IN WOP (1985 DOLLARS) | | -0.78 | -1.49 | -1.99 | -2.30 | -2.09 | -1.08 | -0.50 | 0.40 |
| 3. CHANGE IN PRODUCTION (MILLION BBL/DAY) | | 0.35 | 0.45 | 0.50 | 0.38 | 0.26 | 0.05 | 0.06 | 0.04 |
| 4. CHANGE IN CONSUMPTION (MILLION BBL/DAY) | | -0.88 | -0.83 | -0.77 | -0.59 | -0.34 | -0.02 | -0.25 | -0.14 |
| 5. CHANGE IN IMPORTS (MILLION BBL/DAY) | | -1.38 | -1.28 | -1.27 | -0.93 | -0.56 | -0.03 | -0.32 | -0.18 |
| 6. CHANGE IN IMPORT COST (BILLION 1985 DOLLARS) | | -1.41 | -3.02 | -4.55 | -5.94 | -6.06 | -3.54 | -1.77 | 1.46 |
| 7. WELFARE LOSS (BILLION 1985 DOLLARS) | | -1.84 | -1.38 | -1.05 | -0.43 | -0.04 | 0.01 | 0.03 | -0.01 |
| 8. ONE-YEAR MACRO LOSS (BILLION 1985 DOLLARS) | | -37.24 | 7.17 | 7.18 | 11.67 | 11.81 | 8.62 | -3.56 | -4.76 |
| 9. SECURITY BENEFIT (BILLION 1985 DOLLARS) | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -3.99 |
| B. SAVINGS FROM LOWER IMPORTS | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.64 |
| C. MACROECONOMIC BENEFITS | | | | | | | | | -9.23 |
| 10. GROSS REVENUE FROM FEE (BILLION 1985 DOLLARS) | | 14.69 | 14.99 | 14.94 | 12.43 | 7.33 | 0.00 | 0.00 | 0.00 |

PRESENT VALUE OF COST AND BENEFIT IN 1987
(BILLION 1985 DOLLARS, DISCOUNT RATE 5.00%)

| | Total | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 11. REDUCTION IN IMPORT COST | 20.56 | 1.35 | 2.74 | 3.93 | 4.89 | 4.75 | 2.64 | 1.26 | -0.99 |
| 12. WELFARE LOSS | -4.29 | -1.76 | -1.25 | -0.91 | -0.35 | -0.04 | 0.00 | 0.02 | -0.01 |
| 13. MACRO LOSS | -3.22 | -35.47 | 6.50 | 6.20 | 9.60 | 9.26 | 6.43 | -2.53 | -3.22 |
| 14. SECURITY BENEFIT | | | | | | | | | |
| A. SAVINGS FROM LOWER DISRUPTED OIL PRICES | -2.70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -2.70 |
| B. SAVINGS FROM LOWER IMPORTS | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.11 |
| C. MACROECONOMIC BENEFITS | -6.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -6.25 |
| 15. GROSS REVENUE FROM FEE | 56.47 | 13.99 | 13.60 | 12.91 | 10.23 | 5.74 | 0.00 | 0.00 | 0.00 |
| NET BENEFIT OF OIL IMPORT FEE [11+12+13+14A+14B+14C] | 5.21 | | | | | | | | |